

APPLYING TERM CONSISTENCY TO THE SOLUTION OF UNCONSTRAINED INTERVAL GLOBAL OPTIMIZATION PROBLEMS

ABSTRACT

One embodiment of the present invention provides a system that solves an unconstrained interval global optimization problem specified by a function f , wherein f is a scalar function of a vector $\mathbf{x} = (x_1, x_2, x_3, \dots, x_n)$. The system operates by receiving a representation of the function f , and then performing an interval global optimization process to compute guaranteed bounds on a globally minimum value f^* of the function $f(\mathbf{x})$ and the location or locations \mathbf{x}^* of the global minimum. While performing the interval global optimization process, the system deletes all of part of a subbox \mathbf{X} for which $f(\mathbf{x}) > f_bar$, wherein f_bar is the least upper bound on f^* that has been so far found. This is called the " f_bar test". The system applies term consistency to the f_bar test over the subbox \mathbf{X} to increase that portion of the subbox \mathbf{X} that can be proved to violate the f_bar test.